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AUTHOR DeMarte, Patrick J.; And Others
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ABSTRACT

Presented is a discussion of the evaluation of a parity model, competency-based teacher education (CBTE) program in science education. The evaluation design seeks answers to six questions: (1) Does a competent teacher emerge from the program? (2) Is the program valid with respect to the Concerns Model postulated by Fuller's work? (3) Do the individual instructional components meet their stated criteria? (4) Are the program components arranged for optimum learning? (5) Is the preassessment valid for placement of students in the program? and (6) What is the place of parity (consensus of teachers, school administrators, students, public, and college faculty) in a CBTE program? This paper consists of projected research design problems and considerations. Complete case data will not be available for four to six years after the first students have entered the program because of the time needed for the students to complete the program and gain experience as classroom teachers. The authors are concerned that the data system remain intact for a minimum of 10 years to collect necessary data on several classes of students who complete the CBTE program and teach for two or more years. (Authors/PEB)

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EVALUATION OF A PARITY MODEL COMPETENCY-BASED TEACHER EDUCATION PROGRAM IN SCIENCE EDUCATION

Paper Presented

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in Science Teaching

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Patrick J. DeMarte, Douglas J. Harke,
Wayne Mahood

State University of New York

at Geneseo

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BACKGROUND

The Parity Model described herein is the fortuituous product of three overlapping and commingling forces:

1. the Science Trial Project conducted by the Science Teachers of New York State and funded by the New York State Education Department;

2. Competency-Based Teacher Education program development by the State University of New York at Geneseo; and

3. the New York State Education Department requirement that all teacher education certification programs reflect a competency base.

The history and influence of each will be traced briefly.

In 1969 the Science Teachers of New York State established a STANYS Certification Committee to make recommendations regarding the preparation and certification of science teachers. The Committee was already functioning when, in 1971, STANYS applied to the New York State Education Department for money to sponsor a Science Trial Project (Harke and DeSeyn, 1972). The STP followed the process standards set forth by the NYSED in its working paper, A New Style of Certification (Division of Teacher Education and Certification, NYSED, 1971). The principal standards included the formation of a decision-making process and policy board. The STP met these standards by actively involving school boards, teacher bargaining units, teacher education students, collegiate faculty, STANYS, and a local scientific association in the geographic area near Geneseo. The decision-making and voting parity of these six agencies is the unique feature of this project, which succeeded in developing the following:

a. a master set of objectives for teaching science in the secondary school

b. competencies for teaching science in the secondary school

c. self- and instructor-guided modules to assist teacher education students to meet the competencies

d. a design for evaluation

The last two items are indicative of the joining of forces between the Science Trial Project and the CBTE program development at SUNY Geneseo.

The linkage occurred as a result of the membership of Drs. DeMarte and Harke on the STP Policy Board, as well as their activities as co-developers with Dr. Mahood of the CBTE program at SUNY Geneseo. The latter began in late 1972. This dual membership permitted a bridging of interests and the enlistment of science teachers in identifying general as well as subject matter teacher competencies for the CBTE program. The formal coming together of these two forces occurred in the summer of 1973, when five teachers representing different grade levels joined with eight teachers from STANYS, three teacher education students, and the three collegiate faculty names.

Both forces worked under the guidelines for teacher certification mandated by the State Education Department, including: the identification of teacher competence with a field base rather than total reliance on college courses; the involvement of public schools, higher institutions, professional staffs, and "teachers in training;" a management system to assess attainment of competencies; and program evaluation. The summer workshop resulted in the identification of general areas of teacher competence, in the writing of modules specifying performances required of teacher education students, and in suggestions for program management. Ultimately,

the CBTE program accepted by the faculty governance at SUNY Geneseo was developed out of the work of STP and the summer workshop.

The CBTE Science Education Program

Competency-Based Teacher Education (CBTE) is chosen as the model not only because of a very real State Education mandate, but more importantly, because it seems to offer justification and means to satisfy the needs for changing teacher preparation. The bases for a CBTE program are (Kaufman):

1. Philosophical and psychological
2. Behavioral science models
3. Systems models

1. Philosophical and psychological. The philosophical base stresses the synthesizing of the academic and professional search for knowledge and its application to public school experience. The psychological basis argues that learning styles, not teaching styles, make a difference in the quantity and quality of learning. These bases are linked by the recognition that the full impact and meaning of formal education must rely upon the student's personal growth, including the meaning the student attaches to his behavior. The student is encouraged to make explicit the more covert meaning which accompanies his overt teaching behaviors. In sum, this program asks the student to apply knowledge to "real world" experiences and to assess the meaning and significance of his behavior in teaching situations.

2. Behavioral science models. Behaviorists argue that learning can be shown by a change in behavior, so the teacher can assess learning by observing, recording, and analyzing a learner's behavior. The key element is the prior stating of anticipated learning outcomes so the learner will have a "map" by which he can be guided and assessed as to intellectual and emotional growth. By clarifying purpose and goal the learner is helped to select the means to attain ends.

Because of an alleged propensity of behaviorism to be mechanistic, it is essential to employ a personal assessment model to get to the meaning, significance, or intent behind the individual's behavior. This personal assessment model is superimposed on the behavioral model to encourage a more holistic effect to what might appear to be simply discrete behaviors.

3. Systems models. The systems approach views society as having interactive components which can be viewed totally or as functioning units. The application here is that traditionally teacher education has relied on transcripts and course credits as the "inputs" to determine certification. The emphasis in this program is on both "inputs" (performance criteria) and "outputs" (assessed overall competence) which is the result of activities within the system (instructor-guided learning activities and experiences in schools). The behavior of the teacher education student is the action of a unit within the system (teacher education) which is a part of a larger environment, consisting of communities, school districts, professional education, and the academic disciplines. This also allows for a more manageable scheme for monitoring student progress, for developing cooperative, on-going arrangements with academic disciplines other than science, and for evaluating the program totally and as elements.

Program Components

The program has four essential components to it: an Entering Assessment, Core I, Core II, and an Internship. (See Figure 1 on the following page.) Upon admission to the program all students will be assessed as to knowledge base in professional education, teaching skills, and attitudes. Using the assessment, students will then be advised into the program at the level commensurate with demonstrated competence.

The basic instructional unit is hierarchically and sequentially arranged instructional packets called modules. They correspond to various phases of each component. The module form is (1) the specification of performances (objectives to be attained), (2) activities to enable performances, and (3) assessment procedures to evaluate performance level. Students will, under advisement, select modules which include both self- and teacher-guided activities, complete them at their own pace, and advance to higher levels. Instructors will assist students to attain performance levels, assess attainment, and monitor students' progress.

While primary responsibility for instruction lies with the faculty of the Division of Educational Studies, academic faculty will also work with students in more specialized content areas, e.g., safety procedures for science teachers. Also, interdepartmental committees will be asked to help specify the academic competence for certification and identify further module development.

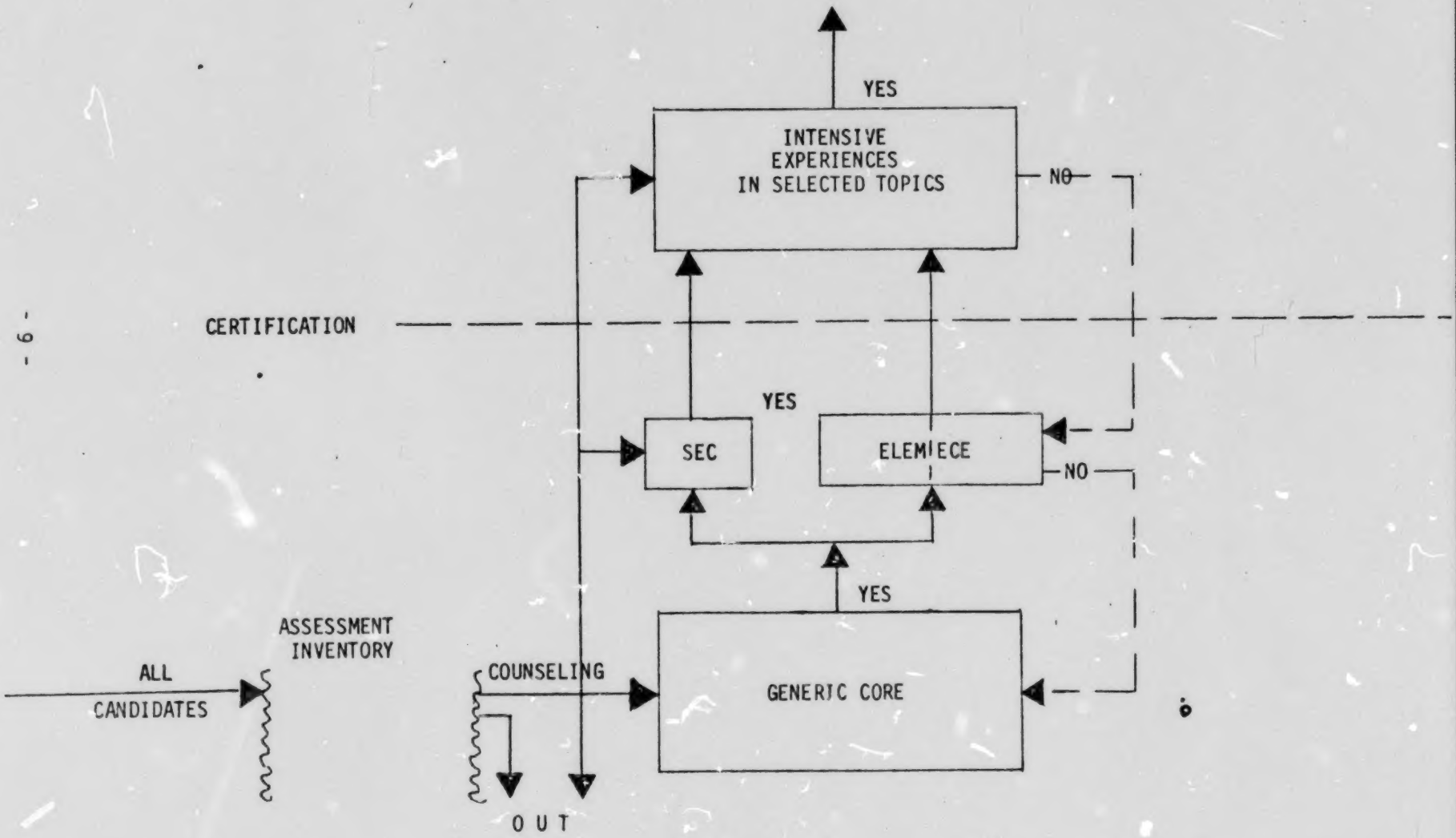
The levels above the Entering Assessment are:

Core (I and II)	Elementary	Secondary
Affective	3 hours	1 hour
Social, Cultural, and Physical Setting	4 "	3 "
Human Development	2 "	1 "
Teaching Skills	6 "	4 "
	15 hours	9 hours
Internship (full semester)	15 hours	15 hours
	30 hours	24 hours

Provisional Certification is granted upon completion of the Internship.

Figure 1

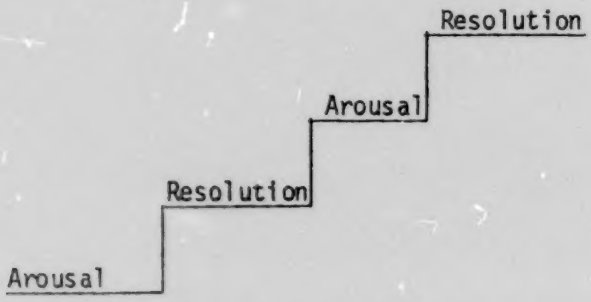
OVERVIEW OF CBTE



The Concerns Model

A common criticism leveled against CBTE programs is the tendency for them to be mechanistic; to "produce" technicians rather than professionals. The bases for this criticism seems to be that identifying specific performances tends to fragment the teaching act into discrete parts and, more importantly, ignores the meanings behind the students' behaviors while in the teaching act. We acknowledge the potential shortcomings of the CBTE model and have superimposed another model which stresses the students' personal growth as well as the students' need to identify and comprehend the range and complexities of their teaching behaviors. The model we have imposed borrows heavily upon the work of Professor Frances Fuller who emphasizes the need for teacher self confrontation, which is a "stressful, arousing, partly covert experience with potential for harm as well as help" (Fuller, 1970; Fuller and Manning, 1973).

The Fuller Model is conceptualized as an arousal of concern about oneself because of some discrepant information from an observer or videotape of the actor (pre- or in-service teacher). The crucial part is what the actor does depending on the degree of satisfaction derived from the confrontation and arousal. That is, once there is arousal of concern for self, some form of resolution must result. Pictorially this can be viewed in the following manner (Fuller, 1970):



If the observed behavior is congruent with the behavior sought or hoped for, greater satisfaction can be anticipated on the part of the actor. If satisfaction is not attained, it is necessary to help the actor arrive at the desired behaviors. The aim is to achieve a realism and congruence between what the actor feels or hopes he is doing and what he actually is. Depending upon the degree of realism, the performance which follows can enhance the actor's ability to perform to his expectations. The ultimate of this model, then, is performance satisfying to the actor--a resolution of the concern, or need.

The fundamental postulate of the Fuller model is that the teacher education student goes through a describable series of "Concerns." For relevance, Fuller hypothesized, teacher education must be directly related to these "Concerns" and may be achieved through individualization and personalization. A program is personalized when it considers the feelings, the motives, questions or concerns of the students. Individualization means that the program is tailored to the students' current needs, feelings, and abilities.

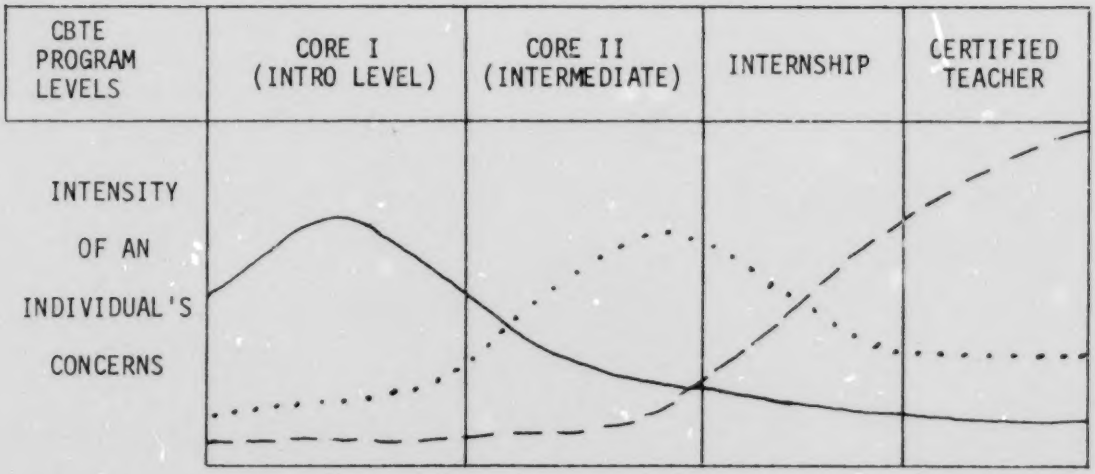
According to Fuller, the teacher education student passes through three phases of concerns (overlapping and varying in intensity over time):

1. Concern About Self
2. Concern About Self as Teacher
3. Concern About Self as Teacher with Pupils

In the sense used here, "Concern" means "a constructive frustration." (Ibid.) (See Figure 2 on the following page)

Figure 2

CONCERNS MODEL



_____ Concern About Self
..... Concern About Self as Teacher
------- Concern About Self as Teacher with Pupils

1. Concern About Self. Our work with pre-service students strongly suggests that the individuals who experience the greatest problems are those who fail to advance beyond this level. Image is important. They are satisfying a parent's desire. ("My daughter, the teacher" is not simply a line from a soap opera.) Or they are fulfilling what they believe to be an earlier teacher's expectation. They tend to be more concerned about appearance than what happens in the classroom. However, at this point it is quite possible to enhance the self image by arousing concern and reinforcing image-sustaining behavior. A lesson that goes well or interaction with pupils which is mutually satisfying and consistent with intent can be identified and supported.

2. Concern About Self as Teacher. At this level, which overlaps the Concern About Self, pre-service students have gained some insights into their own needs and have resolved much of their Concern About Self. They now question their roles in schools, their rewards as teachers, and their adequacy as teachers vis a vis pupils. This is manifested often in terms of problems of maintaining classroom control without losing the respect of their pupils or in terms of subject matter mastery. They are trying to fathom the needs of teachers with whom they interact and whether they share these needs. Lessons are being conducted to their conclusions with more concern for whether learning is occurring than whether an image is maintained.

3. Concern About Self as Teacher with Pupils. Here pre-service students are focusing on whether pupils are actually learning and whether lessons are meeting pupils' needs. Interaction with pupils is more genuine. Also, there is a feeling of being able to control their destinies; a sense of power. This sense of power is vital to the well-being of the teacher who will become subject to the potentially paralyzing effects of working within an organizational setting (Moeller and Charters, 1965-66; Meyers, 1972; Hunter, 1954; and Kozol, 1967).

We believe that it is prime importance that our students reach the third Concern level. Students who have reached this level will be able to comprehend the meaning of their behavior to mean and what it actually does. This should also minimize the difficulties for the instructor who must try to infer meaning from the behavior of students. And this may negate the alleged mechanistic aspects of C/PBTE.

Rationale for the Evaluation Design

The Geneseo/STP CBTE program was derived from several fundamental assumptions regarding teacher education and from which this program evaluation emanates. The following are perceived to be the most vital assumptions for our evaluation design:

2.4 that teacher competence involves a particular set of actions appropriate and unique to that profession.

2.5 that it is possible to identify a minimum level of competence for teacher certification.

2.9 that individuals entering and continuing in teacher education proceed through a sequence of describable, observable, and measurable series of concerns: about self, about self as teacher, and about pupils. (DeMarte, Mahood, and Harke, 1974)

The process of testing these primary assumptions defines the evaluation schema for the entire program.

Assumption 2.4 regards teacher competence as actions appropriate and unique to the profession. This means that any identification and verification of teacher competence must be grounded in the professional base and supported by theory, research, and practice.

There has been an ever increasing amount of literature attempting to identify criteria to assess the effectiveness of teachers and teacher education (Rosner, 1972; McNeil and Popham, 1973; Koehler, 1974). Richard Turner (1972) identifies six "levels of criteria" to assess the effectiveness of teacher education programs. Level one (the most exacting) requires observations of teacher behaviors in classrooms and systematic analysis of pupil

outcomes over a two year period, based on the observed teacher behaviors. Level two is basically the same, but is limited to one year. The third level differs from levels one and two in that it eliminates pupil performance data.

McNeil and Popham (1973) focus on criterion measures which (1) distinguish between teachers, (2) assess the results of instruction in terms of pupil growth, (3) yield objective data (minimizing inferences), (4) are adjustable to teacher goals, (5) equalize teaching situations, and (6) contain "heuristic data categories."

Evaluation of any program or curriculum must have both formative and summative aspects. The formative design which monitors student attainment of competence, allows for immediate revisions, while the summative assessment examines the product of the program and requires the ultimate criteria (pupil performance) to validate lower levels of the program. In essence, the evaluation design of this CBTE program will address Turner's level three criteria for the first formative assessment and use levels one and two for summative evaluation. Instruments selected to assess the variables in this program will be designed with the criteria of McNeil and Popham (1973) as guideposts.

Another consideration in the formulation of evaluation designs for CBTE programs deals with the type of assessment. The goals and nature of a Competency-Based Teacher Education program requires both external and internal validation. Criterion-referenced evaluation is selected as the most suitable method for these evaluations in that competencies and performances are specified for attainment by each student and that normative comparisons of curricula or programs has a history of problems and the validity of such

comparison is, at best, questionable (Walker and Schaffarzick, 1974). In sum, the validity of this program is established on two fronts: (1) in the profession--the degree with which the stated competencies are substantiated by the profession, (2) within the program--the ability of the teacher education program to meet the established criteria.

Significant Questions for the Evaluation Design

The design will seek to answer the following questions:

(1) Does a competent teacher emerge from the program?

A. Are there knowledges, skills, and attitudes unique and appropriate to the profession?

B. Does the teacher possess these knowledges, skills, and attitudes?

C. Does the teacher possessing these knowledges, skills, and attitudes effect pupil growth?

(2) Is the program valid with respect to the Concerns Model?

A. Are the competencies consistent with the model?

1. Does Level 1 (Core I) focus on arousal and resolution of Concerns About Self?

2. Does Level 2 (Core II) focus on the arousal of Concerns About Self as Teacher?

3. Does Level 3 (Internship) focus on the resolution of Concerns About Self as Teacher and the arousal of Concerns About Self as Teacher with Pupils?

4. Does Level 4 (Inservice or Master's) focus on the resolution of Concerns About Self as Teacher with Pupils?

B. Are the actual student concerns in correspondence with the levels of the program?

(3) Do the individual instructional components meet their stated criteria?

A. Are the specified performanced valid?

B. Are the assessment procedures reliable and valid?

C. Are the activities appropriate to meet the stated performances?

(4) Are the program components arranged for optimum learning?

(5) Is the pre-assessment valid for placement of student - in the program?

A. Does the integrated assessments of teaching skills, knowledges, and attitudes match with levels of the program?

B. Can the Concern Level of the student be accurately assessed?

C. Are data collected for the purpose of counseling valid?

(6) What is the place of parity (consensus of teachers, school administrators, students, public, and college faculty) in a CBTE program?

A. Is it possible to establish this cooperative relationship?

B. What are the effects of this parity on:

1. the role satisfaction of the individuals involved?

2. teacher competence?

3. the profession?

Research Design

Operationally the evaluation design seeks to answer the six questions just raised. The summative questions are all asked in the criterion-referenced sense -- do the results measure up to the expectations. The formative questions -- what are the relationships between variables. Successive measurements on the same subjects to determine attainment of objectives dictates that the design be repeated-measures. This is in agreement with Popham and Husek (1969), who state that criterion-referenced evaluation is designed to make decisions both about individuals and treatments. Relationships between both individuals and treatments, by their very nature, are usually expressed as correlations.

Selection of a criterion-referenced program evaluation, in general, limits the design to correlational and quasi-experimental models. Basically the overall research can be summarized as a repeated-measures design and is illustrated in Figure 3.

Figure 3

CBTE students	**O**	X_1	O	X_2	O	X_3	O	X_4	O
Other college students	O		O		O		O		O

O = battery of instruments including measurement of Integrative Teaching Skills and Concern Level

X_1 = Core I

X_2 = Core II

X_3 = Internship

X_4 = In-Service Teaching

Experimentally the two major questions are:

1. Do the students completing the CBTE program demonstrate the desired competence?
2. Is it the CBTE program that effects these changes?

The six evaluative questions are generally subsumed by the first experimental question. Specific analyses of the data to answer these six questions are described later in this paper. The second experimental question, although not germane to a criterion-referenced evaluation, is necessary to determine whether the changes in the CBTE students were brought about by the CBTE program or by external variables such as test conditioning, maturation, general education and life experience.

For the most part, the data to be used for research are gathered throughout the CBTE program for purposes of performance assessment, determination of

teacher competence and advisement. These data will be collected keeping in mind the criteria suggested by McNeil and Popham (1973).

Extensive data will be collected on each student from admission to the program through the point when the student becomes an experienced teacher. The data processing system to be developed for the Geneseo/STP CBTE program must store all pertinent information and provide ready access for counseling, advisement and assessment. Equally important is access to certain parts of the data so that frequency plots, correlations and significance tests can be run to provide rapid feedback for formative assessments.

Likely, complete case data will not be available for four to six years after the first students have entered the program because of the time needed for the students to complete the program and gain experience as classroom teachers. Thus, it is imperative that the data system remain intact for a minimum of ten years to collect necessary data on several classes of students who complete the CBTE program and have taught for two or more years.

A complete listing and classification of the quantitative data follows:

Pre-Assessment Data

1. year in college
2. overall grade point average
3. grade point average in the major
4. Scores from Adjective Self Description (Veldman, 1970)
    a. social attitude
    b. social behavior
    c. performance habits
    d. social orientation
    e. emotional stability
    f. idealogical orientation
    g. appearance and charm

5. Scores from Self Report Inventory (Veldman, 1970)

   a. attitude toward self
   b. attitude toward other people
   c. attitude toward young children
   d. attitude toward authority figures
   e. attitude toward your work
   f. attitude toward life's uncertainty
   g. attitude toward your parents
   h. attitude toward your future
   i. general outlook on life
   j. expression of attitude
   k. relative self - other valuation

6. Scores from One Word Sentence Completion (Veldman, 1970)

   a. response length
   b. repeats
   c. popular responses
   d. negatives
   e. hostility
   f. anxiety
   g. depression

Data Collected While the Student is in the Program

1. For each module:

   a. time spent preparing for each assessment (student estimate)
   b. number of attempts required to complete each assessment
   c. overall module quality or effectiveness as rated by the student
   d. validity of each assessment as perceived by the student
   e. number of activities completed
   f. appropriateness of each activity
   g. validity of each assessment
   h. rating of faculty responsible for module instruction
   i. date of completion for each module

2. For each major breakpoint (Core I, Core II, Internship)

   a. integrated skill assessment (more than one rater)
   b. Concern Level

Data Collected After the Student has become a Teacher

1. Integrated Skill Assessment (more than one rater)

2. Concern Level

3. Pupil Growth

   a. attitudinal development
   b. cognitive development

4. For each module

    a. overall module quality or effectiveness
    b. validity of each performance
    c. validity of each assessment
    d. appropriateness of each activity

Data from the Profession

1. For each module

    a. overall module quality or effectiveness
    b. validity of each performance
    c. validity of each assessment
    d. appropriateness of each activity

2. Frequency of successful completion of each assessment by master teachers

3. Role Satisfaction

Data Analysis

Design Question (1) - Agreement on Teacher Competencies by the Profession.

As indicated earlier, the competencies of the Geneseo/STP CBTE program were identified jointly by teachers, college faculty, administrators and preservice teachers, and reflect their professional experience. It is argued here that the external validity of the competencies can be determined by the profession as a whole. However, due to the large numbers of teachers in New York state, it is necessary to measure acceptance by a randomly selected sample. The sample population would rate each performance in the Core, Internship, and Masters-Inservice area.

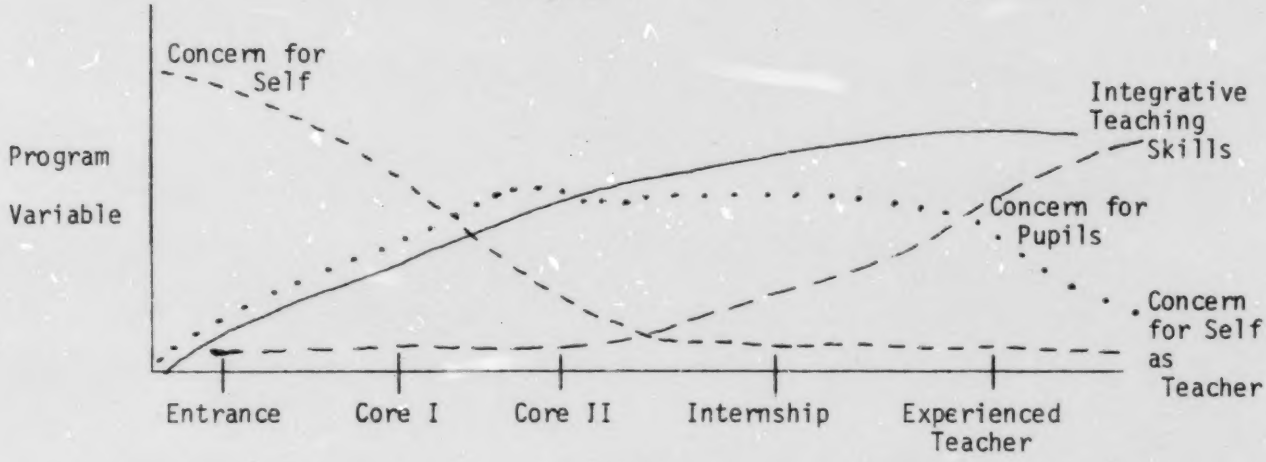
A survey similar to the proposed here was used by the New York State Industrial Arts Trial Certification Project (1974) in Buffalo. Their survey, sent to all industrial arts teachers in New York state, requested the teachers to rank competencies in each of several groupings. Coefficients of Concordance computed from the results were > 0.95, indicating that in this area

of certification the profession can agree on standards of teacher competence.

Design Questions (1) and (2) - Growth of Teacher Competence

Assessment of the students on many specific performances will be done frequently during the Core and Internship phases. Teaching is also an integration of many skills and must therefore be also assessed holistically. This holistic assessment will take the form of two batteries -- one to measure Integrative Teaching Skills and one to measure Concern Levels. Each battery will be administered upon admission to the program, upon completion of Core I, upon completion of Core II, upon completion of the Internship, and after gaining experience as classroom teacher. The expected student growth, according to the goals of the Geneseo/STP program, is shown on the time series plot in Figure 4.

Figure 4



If the plot of the experimental data shows agreement (slope, inflection, and maxima) with the results projected from the goals of the CBTE program, then the program can be considered successful in developing specified attitudes, knowledge and skills at each level. Results derived from this analysis could be used to answer questions relating to whether the student possesses the knowledge, skills and attitudes of a teacher, and whether the program is valid with respect to the Concerns Level.

Design Question (1) - Pupil Growth

According to the theory behind a CBTE program, a teacher's competence is determined by his ability to influence positively pupil growth (cognitive, attitudinal, and psychomotor development). However difficult this relationship is to assess, probably the most direct and least inferential method of determining teacher competence is, in fact, the measurement of pupil growth. This is also consistent with the call for A New Style of Certification (NYSED, 1971) which defines competence as the "capacity to work with children in ways which enhance [pupils'] opportunities for learning." The more direct methods reduce the number of inference levels and hence reduce the experimental error. Although it is possible to idealize the amount of pupil growth, it would be inappropriate to set some test gain scores as an absolute standard in determining teacher competence.

The research design here must try to equalize all variables except teacher variables because the pupil growth measured is to be attributed to teacher competence. Review of the research (Dodl, 1973) indicates that one-to-one relationships between teacher competencies and pupil achievement are difficult to measure because of the interactive nature of the variables. This experience suggests that initial attempts to relate teacher competence to pupil growth must use a single composite score of teacher behaviors and attitudes as the measure of teacher competence, not specific, ongoing behaviors.

Design Question (3) - Evaluation of the Instructional Components

Establishing the validity of the performances in each module is necessary before the other components of a module can be evaluated. This will be done in the part of the research Growth of Teacher Competence which was described earlier. In this procedure the profession will be surveyed to determine their acceptance of the knowledge, skills, attitudes and performances in the program. [defined by the performances.]

The other data to be used to make a formative evaluation of the modules will come from the students as they proceed through the program. Upon completion of each module students will be asked to respond to an opinionnaire (which will include items referring to examining) the validity of each performance and assessment and the appropriateness of each activity. Other opinionnaire items will relate to the performance of the staff in charge of that module.

The student progress data for each module such as number of assessments repeated, time spent preparing to meet each assessment, and number of activities used to meet each assessment can be used to make judgments about the components of a module. For example, an assessment which requires an average of four attempts before successful completion may indicate that it belongs at a higher level in the program or that the learning activities provided are inappropriate.

After the first groups of CBTE students have acquired one to three years of teaching experience, a sample will be selected to rate the validity of the performances and assessments, and the appropriateness of the activities of each module. This retrospective evaluation is of particular value because the students will have had opportunity to integrate their training and apply it to real situations encountered by teachers.

The consistency, or reliability, of each assessment must be determined during the initial years of operation of the CBTE program. This procedure cannot follow the regular internal consistency procedure of finding reliability (Popham and Husek, 1969). Agreement by several assessors as to whether a student is able to demonstrate attainment of a performance will be the measure of consistency.

Design Question (4) - Relationships Between Instructional Modules

Given the hierarchical nature of the program and the module prerequisites, it is expected that students will follow different sequences in completing modules. Student progress, which will be computer-monitored, will provide data as to these different sequences, though it will be impossible to obtain $n!$ sequences for n modules because of the module prerequisites. It is anticipated that the most appropriate sequence is the one which poses the least difficulty for the students -- the difficulty being measured as number of repeated assessments or time spent in preparing for assessments. This sequence is the one which maximizes the correlation between deviation from this sequence and number of repeated assessments or time spent in preparing for an assignment. However, if no identifiable sequence occurs, it may be necessary to change the prerequisites and create new sequences OR to liberalize the structure of the module prerequisites. This procedure must be followed for both Core I and Core II.

Design Question (5) - Pre-assessment as a Tool for Placement and Prediction

Obtaining information for counseling and placement is one of the objectives of the pre-assessment process. This information becomes useful when a measure of relationship between variables can be determined. If the quantitative data available from the pre-assessment are valid, (pages 16, 17), then predictions of the students' progress through the CBTE program can be made. The pre-assessment data from the first few classes would be the independent variables in a multiple regression analysis. Integrative Teaching Skill, Concern Level, number of repeated assessments, and total time spent on preparing for the assessments would be multiple dependent variables. The regression equations developed from this initial data will be used for accurate counseling

into and through the CBTE program. The evaluative phase of this process is the size of correlations between the pre-assessment variables and the program variables and the amount of variance accounted for by the regression equation. High correlations between preassessment and program variables and a sizeable amount of variance accounted for would support claims of validity for the pre-assessment.

The other phase of evaluation of the pre-assessment will deal with the capability of placing students at appropriate entering levels in the CBTE program. It is anticipated that some students will already possess some teaching skills upon entering the CBTE program. The proper placement of these "advanced" students is important both for the benefit of the individual student and the program. If a placement is too high, then the frequency of students undergoing repeated module assessments will be significantly higher than for students who entered at a lower level. This comparison can be repeated for time spent in preparing for the assessments in that module.

The procedure used to determine whether placements are too high, however, cannot simply be reversed to find placements that are too low. The reason is significant differences in favor of the advanced placement students might be the result of their possessing higher ability. Information about whether placements are too low for a particular module would then have to be obtained from the evaluation form each student will complete after finishing each module.

Design Question (6) - The Effect of Parity in a CBTE Program

The unique feature of the Geneseo STP/CBTE program development has been the decision-making and voting parity of the collegiate and public school representatives to the STP policy board. This has been suggested by proponents of CBTE as a necessity for the upgrading of teacher education and the profession

generally. However, measuring the effect of joint decision-making poses problems, especially for quantitative measurement. An alternative is the indirect measure of the perceptions of the participants, and it is recognized that this may well require the insights and tools of the social scientists to obtain entirely satisfactory measures.

For our purposes the research proposed would be a time-series design (Campbell & Stanley, 1963) with successive administrations of a survey to policy-board representatives prior to participation in the program, during the early phases (late development and early implementation) and after the program is fully operational (two to three years). The survey would include items related to the following variables:

1. The degree to which decision-making is democratic or autocratic.
2. The extent of decision-making "saturation" or "deprivation" (Alutto & Belasco, 1972).
3. The consistency of the representative role with the occupational role.
4. The consistency of the representative role with career aspirations.
5. The representatives' perceptions of their effect on the program due to their participation in decision-making.
6. The representatives' willingness to make the program functional.
7. The degree to which there is enhancement of the professional image.

Data derived from analyses of the first four variables would help answer the questions regarding role satisfaction. Data derived from analyses of variables five and six would help answer questions regarding the program, and the last variable relates to professional effect. The analyses could take the form of comparisons of representatives' attitudinal changes pre, during, and after their participation in the program.

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